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ECONOMY AT YEAR-END

by DAVID I. VERWAY, *Research Professor, Division of Research, Graduate School of Business Administration, Michigan State University*

Among Michigan's 63 labor markets, only Ontonagon County experienced no employment decline in any of its broad economic sectors between October 1979 and October 1980. Nine other labor markets in Michigan showed overall employment gains during the October-October period, but declines in some categories. The recently formed Upper Peninsula Shipbuilding Company is largely responsible for the gain in Ontonagon.

In Delta County, second in percentage gain in nonfarm wage and salary jobs, Mead Paper Company is expanding its plant in Escanaba, creating jobs for approximately 700 construction workers.

Three other Upper Peninsula labor markets were among the gainers: Houghton-Keweenaw, Chippewa, and Alger counties. The new Copper Country Mall and increases in durable goods manufacturing and state government employment have provided the stimulus in the Houghton-Keweenaw area. Chippewa County hosts one of the nation's finest industrial parks, on the site of Kincheloe Air Force Base, closed down in 1977. Base housing was sold to a private developer, who can offer the homes at very attractive prices. Alger County has experienced improved tourism this year in comparison with the very depressed level of 1979, when the gasoline scare discouraged travel to the U.P. generally.

Employment in Marquette and Menominee counties declined at a sharper rate than statewide between October 1979 and October 1980. Both the Empire and Republic mines, operated by Cleveland Cliffs, have been closed due to low demand for iron ore. Also, several hundred construction jobs are absent from this year's data, since Cleveland Cliffs has completed its new facilities. Menominee is economically depressed by the slump in durable goods manufacturing.

All told, the U.P. experienced about the same rate of job decline as the state as a whole.

Among the dozen areas most heavily affected by this year's slump, ten are located in the northern Lower Peninsula. Except for Lake and Presque Isle counties, the primary factor was curtailed durable goods production and the spinoff effects on those small economies. Presque Isle hosts two mines that ship limestone to steel mills and cement kilns. In the tiny Lake County economy, tourism was a disappointment.

Two of the dozen areas most affected by this year's economic conditions are in southern Michigan. Branch and Hillsdale counties were victims of slumping durable goods production. The same phenomenon is responsible for the situation in Jackson, the most severely depressed of Michigan's Standard Metropolitan Statistical areas. The complete list is shown in Table 1.

Michigan lost more than 140,000 nonfarm wage and salary jobs between October 1979 and October 1980, a decline of almost 4 percent. Between the previous peak level in this statistical series (February 1979) and the deepest point of the recession (August 1980), the number of such jobs declined by 300,000. Since August, 60,000 of those jobs have been recovered owing largely to production of 1981 model passenger and commercial vehicles.

By every measure, Michigan has been more seriously affected by this recession than has any other state. Largely unscathed are Wyoming,

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TABLE 1
Percentage Change in Nonfarm Wage and Salary Jobs in Michigan Labor Markets: October 1978–October 1980

Areas	Oct. 1979 to Oct. 1980	Oct. 1978 to Oct. 1979	Areas	Oct. 1979 to Oct. 1980	Oct. 1978 to Oct. 1979
Charlevoix	−15.4	+ 1.1	Muskegon, Oceana	− 3.3	+ 1.1
Montmorency	−15.0	−23.1	Isabella	− 3.1	+ 3.5
Lake	−14.6	+ 5.1	Schoolcraft	− 3.0	0
Missaukee, Wexford	−13.5	+ 7.5	Barry, Calhoun	− 2.6	− 1.9
Crawford	−11.0	− 1.0	Otsego	− 2.6	− .9
Manistee	−10.5	+ 2.9	Roscommon	− 2.6	+ 5.5
Antrim	− 9.8	+ 4.5	Washtenaw	− 2.5	+ .9
Presque Isle	− 9.5	− 4.5	Kalamazoo, Van Buren	− 2.3	+ 2.0
Branch	− 9.4	− 7.2	Dickinson	− 2.2	+ 1.0
Hillsdale	− 9.0	− 5.9	Gogebic	− 2.1	+11.4
Ogemaw	− 8.6	− 3.2	Iron	− 2.1	− 2.1
Emmet	− 8.4	− 2.2	Mason	− 2.1	− .3
Jackson	− 7.6	− .5	Allegan	− 1.9	+ 1.9
Cass	− 7.5	− 6.6	Clinton, Eaton, Ingham, Ionia	− 1.3	+ 1.3
Huron	− 7.4	+ 1.9	Kent, Ottawa	− 1.2	+ 1.5
Marquette	− 7.1	− 3.8	Mackinac	− .8[1]	− 2.4
Arenac	− 7.0	−10.9	Alpena	− .5	− 7.0
Alcona, Iosco	− 6.7	− 2.2	Gladwin, Midland	− .4	+ 1.9
Genesee, Shiawassee	− 5.8	− .3	Grand Traverse, Kalkaska, Leelanau	− .3	+ 1.9
Berrien	− 5.7	− 1.2	Baraga	0	− 2.8
Lenawee	− 5.2	+ 2.7	Luce	0	+ 2.3
Oscoda	− 5.1	− 2.5	Gratiot	+ .2	− 4.0
Saginaw	− 4.8	− 2.7	Chippewa	+ .3	− 6.6
Benzie	− 4.3	+ 2.6	Newaygo	+ .8	− 1.2
Menominee	− 4.3	+ 6.3	Mecosta	+ 1.0	− 3.5
Tuscola	− 4.3	+ 3.5	Alger	+ 1.1	0
Clare	− 4.1	− 6.2	Osceola	+ 1.1	+ 3.4
Lapeer, Livingston, Macomb,			Houghton, Keweenaw	+ 4.1	− 1.9
Oakland, St. Clair, Wayne	− 3.9	− 2.8	St. Joseph	+ 4.2	− 2.9
Bay	− 3.7	− 1.4	Delta	+ 6.0	− .9
Montcalm	− 3.5	+ 3.7	Ontonagon	+ 7.0	+ 8.4
Cheboygan	− 3.4	+ 5.4			
Sanilac	− 3.4	− 6.4	Michigan	− 3.9	− 1.3

SOURCE: Developed from Michigan Employment Security Commission, special release.
1. For the year as a whole, Mackinac County will show a substantial gain due to especially high level employment during the summer.

Louisiana, Texas, and Oklahoma, all petroleum and natural gas exporters, and Florida, Nevada, and Massachusetts. Florida attracts retirees and others who enjoy its climate. Nevada's casinos attract big spending tourists and conventioneers. Massachusetts has fashioned a high technology economy out of what was, until a few years ago, an economy almost as volatile as Michigan's.

November nonfarm job figures are not available at this writing (18 December), but November data on civilian employment, which includes farm employment as well as domestic and other self-employed, were released 5 December. They showed a slippage from October, on a seasonally adjusted basis, and the October figure was itself below September's, evidence that the recovery in Michigan has aborted. High interest rates and scarcity of money for installment loans have depleted the ranks of vehicle customers, forcing production cuts and layoffs in the automotive industry. Quite likely, layoffs will increase in December and again in January. Chrysler Corporation already has furloughed its production workers until mid-January; its suppliers will react accordingly. It is conceivable that by February 1981 the slump in this state will exceed the depths plumbed in August 1980.

Short-term interest rates have skyrocketed, and money is scarce. This is largely attributable to the Federal Reserve Board's tightening of the money supply as well as to high loan demand to finance unsold merchandise. Inventories are high in retailers' warehouses, on new car lots, in petroleum bulk storage, in gasoline and diesel fuel tanks, in manufacturers' warehouses, and nearly everywhere else in the economy.

OUTLOOK: 1981

The new year opens against the backdrop of an OPEC design to raise oil prices. Even so, notwithstanding the supply question posed by protracted hostilities between Iran and Iraq, a sharp runup in the price of gasoline is unlikely because, in the face of bloated worldwide stocks of petroleum and its derivatives, demand is declining. Holding inventories is expensive at today's interest rates.

Even if the new administration deregulates oil immediately rather than in September, as now scheduled, gasoline prices in this country are not likely to increase more than a few cents a gallon, say, 8 percent. Middle distillates will increase more rapidly because of a cold winter; these include home heating oil, jet fuel for airplanes, and diesel fuel for cars, trucks, and buses, among other end uses.

On 1 January 1981 the rate of Social Security contributions rises from 6.13 percent each for employer and employee on the first $25,900 of each worker's earnings this year to 6.65 percent each on the first $29,700. A general cut in tax rates on personal and corporate income, coming possibly as early as April, will neutralize the Social Security hike and then some. Likely, the tax cut will be retroactive, creating, in effect, lump-sum rebates in the first paychecks affected.

The nation already is in the early stages of an inventory liquidation, evidenced by pre-Christmas sales, Chrysler rebates, and Ford sales incentives. Excepting food, interest rates, and energy, the dominant pressures on prices already point toward moderation in the rate of inflation. Even in food, there is some evidence that the upward forces on prices are going to be less intense than many, including this author, were predicting two months ago.

Barring a shock, such as another major war in the Middle East, the stage is set for a sharp decline in short-term interest rates in early 1981 and for some relief from price inflation. If this does occur, all of the fundamentals are in place for a shift in demand toward the larger and mid-size passenger cars and the vans and recreational vehicles that Michigan is well positioned to supply. The physical need for them is intensifying because of the drop in vehicle purchases since March 1979 by households that require larger vehicles and would like to replace their aging fleet of inefficient cars purchased during the early 1970s.

According to the scenario suggested by considerations such as these, Michigan faces another winter of rising unemployment and welfare rolls, fiscal crises in state and city governments, and loss of human capital as people seek work elsewhere. Even though Chrysler likely will survive with help from Washington, more of its plants will close, at least temporarily. Some supplier plants will close also.

The rate of unemployment will climb to over 14 percent (not seasonally adjusted) in February 1981 and end the year above 10 percent. Civilian employment, which reached its high point of 4,045,000 in July 1979, is expected to dip to 3,725,000 in February 1981. That represents a contraction of 320,000, peak to trough, or 8 percent. Those figures are seasonally adjusted. By December 1981, 220,000 of that deficit will have been eliminated as the recovery gains momentum.

Typically, the average length of workweek in factories lengthens more rapidly than the increase in number of jobs during the early stages of recovery. For many tasks that need to be performed, it is easier, less risky, and cheaper to extend hours of those already in the plant than it is to recall those on layoff or to hire new workers. For 1980, the workweek will average around 40 hours in Michigan factories. It can be anticipated that the 1981 figure will be about 42 hours. Average weekly earnings of production workers in 1981 will climb to approximately $440, compared with this year's $375, estimated. The 1979 figure was $360. The 17 percent gain forecast for 1981 may seem modest in light of the hike in overtime, premium pay, and today's wage escalation, but special dampening factors next year include a wage freeze at Chrysler and the possibility of one at Ford.

During the calendar year, about 2.8 million motor vehicles will be assembled in Michigan, compared with 2.2 million estimated for 1980. For the United States as a whole, car, truck, and bus production will total 9.3 million, compared with 8.2 million estimated for 1980.

Michigan tourism should benefit from the rapidly rising costs of air travel and the inconvenience of service from medium sized metropolitan areas in Michigan, Ohio, and Indiana. These factors are making northern Michigan more competitive with the South and West in travel cost as well as accessibility. Detroit does a brisk convention business. On a lesser scale, several outstate Michigan cities are becoming known in the business travel and convention business. This is especially true of Grand Rapids, Traverse City, and Kalamazoo. Battle Creek is joining this market, and there is every reason to believe that Lansing will, too.

AROUND THE STATE

Developments already under way put Delta, Crawford, and Ontonagon counties in the top growth echelon. In Delta, the Mead expansion is gaining a momentum that will produce a construction peak next summer and have a large effect on the area through purchases from local suppliers and increased payrolls of construction workers. Crawford is slated for construction by Weyerhauser, which will be building a wafer board plant suited to mixed hardwood forests and a resin plant to supply the binding agent. In Ontonagon County, UPSCO will be employing additional workers as it reaches full capacity to produce barges, and a refining plant is to be built at White Pine to remove silver from copper.

Mackinac Island is expected to enjoy a very good summer tourist season, a big plus for Mackinac and Cheboygan counties. Several other vacation areas in the northern Lower Peninsula also can expect business to be much improved over 1980, offsetting sluggishness in manufacturing and mining activities.

In southern Michigan, St. Joseph County is growing rapidly because of the new General Motors Hydramatic plants in Three Rivers and Constantine. Flint should be the growth leader among Standard Metropolitan Statistical Areas. General Motors intends to build a new assembly plant in that area, creating construction jobs. Meanwhile, Buick assembly in the old plant should increase next spring to match the anticipated sales pace. The Chevrolet small truck plant also will have to add workers to satisfy demand, after the winter lull.

Several counties should experience employment increases in 1981 but still remain depressed. Charlevoix is perhaps the best example. Its 4 percent job gain, predicated on tourism stimulating an otherwise torpid economy, will not make up for the sharp downturn of 1980.

The above analysis of areas within the state was based on questionnaires returned from chambers of commerce and other local experts along with conversations with economists and planners in the various areas. Where local contacts could not be established, the 1974–1975 pattern of change, modified to suit current conditions, was used. Table 2 has a ranking of labor markets according to job expectations during the coming year.

Questionnaires also were sent to all of the state's banks

(Continued on page 6)

The MICHIGAN STATE ECONOMIC RECORD

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Michigan Economic Indicators

Item	Year previous of latest month	Previous month	Latest month
Manufacturing workers:			
Average weekly hours, Michigan	40.6	39.6	40.1 (Sep.)
Average weekly hours, U.S.	40.3	39.3	39.8 (Sep.)
Average hourly earnings, Michigan ($)	8.74	9.38	9.64 (Sep.)
Average hourly earnings, U.S. ($)	6.80	7.30	7.42 (Sep.)
U.S. motor vehicle production (units)	819,068	852,664	708,964 (Nov.)
Michigan electricity usage (mil. kwh.)	5,998	6,105	5,900 (Sep.)
Industrial (mil. kwh.)	2,881	2,520	2,598 (Sep.)
Residential (mil. kwh.)	1,751	2,030	1,874 (Sep.)
Raw steel production:			
Michigan (000 net tons)	823	546	737 (Oct.)
United States (000 net tons)	10,810	7,767	9,442 (Oct.)
Consumer price index (1967 = 100)			
Detroit area	231.3	264.3	266.4 (Nov.)
United States	227.5	253.9	256.2 (Nov.)
U.S. wholesale price index (1967 = 100)	247.2	277.0	278.4
Michigan farm prices received index (1967 = 100)	229	259	263 (Oct.)

SOURCES: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Motor Vehicle Manufacturers Association, Inc.; American Iron and Steel Institute; and Edison Electric Institute.

Contracts for Future Building, First 10 Months: 1979 and 1980

(Thousands of Dollars)

Area	Nonresidential			Residential			Total[a]		
	1979	1980	Percentage change	1979	1980	Percentage change	1979	1980	Percentage change
Ann Arbor	68,232	92,135	+ 35	68,431	53,238	− 22	136,663	145,373	+ 6
Battle Creek	30,444	23,212	− 24	39,796	16,624	− 58	70,240	39,836	− 43
Bay City	10,610	16,416	+ 55	15,816	17,120	+ 8	26,426	33,536	+ 27
Detroit	875,239	804,440	− 8	998,467	513,223	− 49	1,873,706	1,317,663	− 30
Flint	71,712	69,370	− 3	81,107	33,956	− 58	152,819	103,326	− 32
Grand Rapids	248,349	151,142	− 39	155,291	123,309	− 21	403,640	274,451	− 32
Jackson	16,334	38,334	+135	17,797	9,504	− 47	34,131	47,838	+ 40
Kalamazoo–Portage	39,423	33,723	− 14	62,540	55,398	− 11	101,963	89,121	− 13
Lansing–East Lansing	82,766	100,669	+ 22	140,477	84,102	− 40	223,243	184,771	− 17
Muskegon–Norton Shores–Muskegon Heights	19,771	14,681	− 26	24,351	24,663	+ 1	44,122	39,344	− 11
Saginaw	35,313	33,074	− 6	49,482	28,230	− 43	84,795	61,304	− 28
Michigan	1,711,123	1,515,930	− 11	2,153,064	1,292,814	− 40	4,707,693	3,407,925	− 28
United States	42,958,900	42,907,600	− —	65,665,700	51,620,700	− 21	146,210,100	121,428,100	− 17

SOURCE: F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases.

NOTE: Battle Creek includes Barry and Calhoun counties; Detroit includes Lapeer, Livingston, Macomb, Oakland, St. Clair, and Wayne counties; Flint includes Genesee and Shiawassee counties; Grand Rapids includes Kent and Ottawa counties; Kalamazoo-Portage includes Kalamazoo and Van Buren counties; Lansing–East Lansing includes Clinton, Eaton, Ingham, and Ionia counties; and Muskegon–Norton Shores–Muskegon Heights includes Muskegon and Oceana counties.

a. Excludes nonbuilding construction contracts. This category comprises streets and highways, bridges, dams, reservoirs, river and harbor development, sewerage and water supply systems, missile and space flight facilities, airports, utilities, and communication systems. For Michigan the 1979 and 1980 figures for nonbuilding construction contracts were $843,506,000 and $599,181,000 respectively, or a decrease of 29 percent. U. S. figures for nonbuilding construction contracts were $37,585,500,000 and $26,899,800,000 or a decrease of 28 percent.

Year-to-Year Change in Selected Economic Indicators

Indicator	Percentage change from previous year												
	1979			1980									
	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.
Civilian employment													
United States	+ 2.1	+ 2.0	+ 2.2	+ 1.8	+ 1.6	+ 1.1	+ .9	+ .5	− .1	− .3	− .1	− .3	− .2
Michigan	+ 1.4	+ 1.4	− .9	− 2.1	− 3.1	− 4.3	− 4.4	− 7.3	− 6.5	− 7.3	− 4.1	− 5.1	− 5.2
Detroit area[a]	− .4	− .5	− 2.1	− 3.7	− 4.6	− 5.6	− 6.0	− 8.8	− 7.9	− 8.2	− 4.8	− 5.9	
Outstate[b]	+ 3.0	+ 3.1	+ .3	− .6	− 1.8	− 3.0	− 2.9	− 5.9	− 5.2	− 6.5	− 3.5	− 4.4	
Wage and salary jobs[c]													
United States	+ 3.0	+ 2.6	+ 2.4	+ 2.4	+ 2.3	+ 1.9	+ 1.7	+ .9	+ .1	− .2	−	+ .1	+ .2
Michigan	− 1.3	− 2.2	− 2.3	− 2.9	− 3.5	− 3.8	− 4.9	− 7.0	− 6.9	− 7.2	− 4.8	− 4.8	− 3.9
Detroit area[a]	− 2.9	− 3.8	− 3.2	− 3.8	− 4.6	− 4.9	− 6.3	− 8.1	− 7.6	− 7.7	− 4.8	− 4.8	− 3.9
Outstate[b]	+ .2	− .7	− 1.4	− 2.0	− 2.3	− 2.7	− 3.5	− 6.0	− 6.2	− 6.7	− 4.8	− 4.8	− 3.9
Average workweek[d]													
United States	− 1.0	− 1.5	− 1.2	− .7	− 1.0	− 2.0	+ 1.3	− 2.0	− 2.5	− 2.8	− 1.8	− 1.2	− 1.2
Michigan	− 7.6	−10.1	− 8.5	− 5.9	− 7.0	− 6.5	+ 6.4	− 6.4	− 5.5	− 3.6	− 2.2	− 1.2	+ .2
Average weekly earnings[e]													
United States	+ 6.7	+ 5.9	+ 6.3	+ 6.3	+ 6.1	+ 5.5	+ 9.6	+ 5.4	+ 5.3	+ 5.5	+ 7.0	+ 7.8	+ 8.3
Michigan	− 1.1	− 6.3	− 3.4	− .6	− 1.5	+ .3	+14.6	− 2.2	+ 1.5	+ 3.4	+ 6.6	+ 8.9	+12.5
Motor vehicle assembly													
United States	−20.1	−31.8	−33.5	−38.2	−33.9	−36.6	−28.5	−50.2	−43.7	−48.2	−32.4	−17.6	−16.7
Michigan	−46.8	−29.8	−41.0	−40.7	−38.7	−49.7	−40.6	−62.1	−50.9	−54.4	−35.8	−20.1	−16.2
General Motors	−19.4	−17.8	−27.6	−24.0	−23.7	−45.0	−36.0	−60.9	−49.3	−44.9	−36.9	−22.7	− 9.2
Ford	−18.2	−28.3	−51.4	−52.7	−49.1	−47.2	−46.7	−54.1	−34.7	−69.0	−31.3	−15.7	−18.0
Chrysler	−62.4	−64.8	−69.1	−77.5	−80.5	−74.0	−54.9	−77.1	−73.7	−86.2	−48.5	−16.5	+34.5
Steel tonnage poured													
United States	−10.7	−14.2	−15.4	− 3.6	− 2.2	− 9.0	−12.6	−27.9	−38.7	−42.5	−37.9	−26.3	−12.7
Michigan	−20.5	−18.2	−18.9	−16.3	− 7.8	−20.7	−18.7	−42.9	−62.7	−54.8	−52.0	−33.4	−10.4
Commercial electricity consumption													
United States	+ 1.0	+ 2.2	+ .8	− 2.1	− .7	+ 1.7	+ 1.4	− .8	+ 1.1	+ 6.4	+ 7.9	+ 8.3	
Michigan	+ 1.0	+ 3.5	+ 2.3	− 2.7	+ .7	+ .2	+ 3.9	− 2.8	− 4.4	+ 2.0	+ 4.6	+ 5.2	
Industrial electricity consumption													
United States	+ .3	+ .1	− .7	− 1.0	+ 1.1	− 1.0	− 2.8	− 6.4	− 7.2	− 7.7	− 6.4	− 2.0	
Michigan	−10.1	−11.2	−13.2	−16.0	−10.1	−14.7	−10.3	−26.1	−28.2	−19.8	−13.3	− 9.8	
Nonresidential construction contracts													
United States	+14	− 6	+18	+10	+12	+ 3	− 5	− 7	+ 6	+ 6	− 2	− 1	+ 6
Michigan	− 5	+28	− 8	+28	−33	−24	+ 1	+15	+ 8	+31	−38	−41	+10
Residential construction contracts													
United States	− 3	−21	− 9	− 9	− 5	−34	−39	−44	−30	−11	−17	− 2	−
Michigan	−25	−24	−28	−27	−13	−37	−69	−55	−55	−37	−38	−22	+ 5
Nonbuilding construction contracts													
United States	−41	− 7	−19	−20	−60	−36	−50	−33	−24	−41	+76	+ 3	−13
Michigan	+28	−70	−71	−76	−49	+28	−51	−41	−24	−29	− 8	+35	−11
Retail sales													
United States	+11.2	+10.5	+ 8.3	+12.1	+14.6	+ 3.5	+ 4.9	+ 4.3	+ 1.9	+ 9.2	+ 3.4	+ 5.4	+ 8.2
Michigan	+ 5.2	+ 4.7	+ 5.0	+ 8.9	+ 7.3	− 3.6	− 1.8	− 4.1	− 5.9	+ 6.1	− 2.4	+ 1.2	+ 2.8
Detroit area[a]	+ 1.5	+ 4.9	+ 5.1	+ 9.6	+ 7.4	− 2.0	+ .1	− 4.0	− 4.0	+ 8.9	+ 1.5	+ 6.4	+11.2
Detroit city	− 3.5	+ .7	+ 6.4	+20.0	+14.1	+ 4.6	− .7	− 6.8	−10.6	− 4.2	− 9.6	− 3.7	+ .7
Suburbs	+ 2.5	+ 5.8	+ 4.8	+ 7.5	+ 6.0	− 3.4	+ .2	− 3.4	− 2.6	+11.7	+ 3.7	+ 8.1	+13.3
Outstate[b]	+ 9.7	+ 4.5	+ 4.9	+ 8.0	+ 7.2	− 5.5	− 4.0	− 4.3	− 8.3	+ 2.8	− 6.7	− 4.6	− 6.7
Consumer price index													
United States	+12.2	+12.6	+13.3	+13.9	+14.1	+14.7	+14.7	+14.4	+14.3	+13.2	+12.8	+12.7	+12.6
Detroit[a]	+13.1	+14.5	+15.3	+15.7	+15.1	+14.8	+16.4	+16.1	+19.2	+15.6	+14.8	+16.0	+16.3

SOURCE: Michigan Employment Security Commission, special release; Bureau of Labor Statistics, *The Employment Situation* (monthly); Motor Vehicle Manufacturers Association, special release; American Iron and Steel Institute, special release; Energy Information Administration, special release; F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases (monthly); and Bureau of the Census, *Monthly Retail Trade*.

a. Wayne, Oakland, Macomb, Livingston, Lapeer, and St. Clair counties.
b. Michigan minus Detroit area.
c. The number of wage and salary jobs, except agricultural, reported by employers.
d. Average hours worked by manufacturing production workers.
e. Average earnings among manufacturing production workers.

ECONOMY AT YEAR-END

(Continued from page 3)

and savings and loan associations requesting them to express their judgments about their areas and Michigan's future in a very general way. They were asked to compare the general level of economic activity in the third quarter of 1980 with that expected in the last quarter of 1980 and each quarter in 1981. Those results are tabulated in columns 1 - 5 of Table 3. In order to summarize them, this author assigned weights of 0 for the answer "same," −2 for "slightly worse," −4 for "quite a bit worse," −8 for "substantially worse," +2 for "slightly better," +4 for "good increase," and +8 for "substantial increase.' The results of this exercise are shown in the bottom panel of Table 3.

On balance, these financial executives expected a worse fourth as compared to third quarter in 1980 in every region of Michigan. With the exception of the northeast, not much improvement is anticipated during the first quarter of 1981, but then the economy of the state and of each of its regions is forecast to strengthen, entering 1982 on an upswing (see Table 3).

In answer to another set of questions, with the exception of southwest Michigan, these executives expect their areas to have an improved level of economic activity for 1981 as a whole over 1980. They also expect the state as a whole to experience less economic activity during the coming year. That seeming inconsistency can be explained by there being only five returns from Wayne County, an area which, like Berrien County in the southwest, might indeed suffer from declining activity through much of 1981. Nearly all of Chrysler's employment, it must be remembered, is in Wayne County.

Respondents expect good improvement during 1982 statewide and in their own areas, especially the latter. There is continued growth projected into 1983, slight growth in 1984, and none in 1985, if the responses are taken literally. Indeed, the answers seem to indicate a slight downturn for 1985. Because of the vagueness of the question, and the fact that various individuals attached different scales to the choices of economic change listed for them, perhaps only one definite conclusion should be attempted: The bankers and savings and loan executives who responded to the questionnaire (approximately 35 percent of those queried), anticipate a weak Michigan economy during 1981 and strength for 1982 and 1983.

TABLE 2
Michigan Labor Markets Listed According to Ranking in Forecast of Job Change: 1980–1981

Name of area	*Counties included*
4.5 percent or more growth	
Grayling	Crawford
Escanaba	Delta
Ontonagon	Ontonagon
St. Ignace	Mackinac
Three Rivers	St. Joseph
3.0 to 4.4 percent growth	
Traverse City	Grand Traverse, Kalkaska, Leelanau
Sault Ste. Marie	Chippewa
Baldwin	Lake
Newaygo	Newaygo
Roscommon	Roscommon
Alpena	Alpena
Flint	Genesee, Shiawassee
Iron Mountain	Dickinson
Cheboygan	Cheboygan
Reed City	Osceola
1.5 to 2.9 percent growth	
Marquette	Marquette
Clare	Clare
Mt. Pleasant	Isabella
Manistee	Manistee
Big Rapids	Mecosta
Adrian	Lenawee
Houghton, Hancock	Houghton, Keweenaw
Gaylord	Otsego
Charlevoix	Charlevoix
Frankfort	Benzie
Standish	Arenac
Midland	Gladwin, Midland
Alma	Gratiot
Ironwood	Gogebic
Kalamazoo, Portage	Kalamazoo, Van Buren
0 to 1.4 percent growth	
Lansing, East Lansing	Clinton, Eaton, Ingham, Ionia
Petoskey	Emmet
Battle Creek	Barry, Calhoun
East Tawas	Alcona, Iosco
L'Anse	Baraga
Greenville	Montcalm
Mio	Oscoda
Manistique	Schoolcraft
Grand Rapids	Kent, Ottawa
Mancelona	Antrim
Iron River	Iron
Bay City	Bay
Munising	Alger
Dowagiac	Cass
Muskegon, Norton Shores, Muskegon Heights	Muskegon, Oceana
Saginaw	Saginaw
Detroit	Lapeer, Livingston, Macomb Oakland, St. Clair, Wayne
.1 to 1.5 percent decline	
Menominee	Menominee
Rogers City	Presque Isle
Ann Arbor	Washtenaw
Ludington	Mason
Cadillac	Missaukee, Wexford
Allegan	Allegan
Newberry	Luce
West Branch	Ogemaw
Caro	Tuscola
1.6 to 3.0 percent decline	
Jackson	Jackson
Bad Axe	Huron
Sandusky	Sanilac
3.1 percent or more decline	
Atlanta	Montmorency
Coldwater	Branch
Benton Harbor	Berrien
Hillsdale	Hillsdale

NOTE: Growth is based on annual average for 1980 and 1981. Monroe County is part of the Toledo, Ohio, labor market. No forecast has been prepared for this area by this author.

Focusing on 1982 alone, the northern lower peninsula expects to be the strongest section of the state, and, on average, respondents expect Wayne County to be the weakest.

BEYOND 1981

It seems unlikely that the loan guarantee board will reject Chrysler's latest bid. If it does, Chrysler will likely find a suitor, if not Peugeot or Mitsubishi, then possibly one of its major suppliers. If Chrysler is forced into bankruptcy, it will be reorganized. Whatever form the reshuffling takes, the outcome for Michigan jobs will be much the same: even fewer than the present level of approximately 40,000. During 1978, the company had more than 80,000 Michigan employees; by March 1981, the figure will probably be about 35,000. If the automotive scenario sketched above holds, that figure might climb back to 40,000 at year-end.

Ford employs about 35,000 fewer people in Michigan now than during fall 1978. The kind of turnaround envisaged in the automotive forecast would entail recovering at most 15,000 of those jobs by the end of 1981.

General Motors employment in the Wolverine State conceivably could be 20,000 greater in December 1981 than now. Suppliers located here also will increase their work forces.

By fall 1982, Volkswagen will be employing about

TABLE 3
Results of a Survey of Michigan Banks and Savings and Loan Associations, Mailed 25 November 1980, Received by 12 December 1980

	Number anticipating each degree of change in general level of economic activity compared with third quarter 1980					*Number anticipating each degree of change in general level of economic activity compared with full year 1980*				
	1980	*1981*								
Degree of Change	*4th quarter*	*1st quarter*	*2nd quarter*	*3rd quarter*	*4th quarter*	*1981*	*1982*	*1983*	*1984*	*1985*
Own Area										
Substantially worse	14	14	6	3	1	3	1	1	1	1
Quite a bit worse	19	18	7	2	2	3	2	2	2	2
Slightly worse	47	44	28	11	8	23	4	2	5	7
Same	32	35	43	25	12	36	15	13	15	15
Slightly better	16	17	41	78	75	59	76	41	32	31
Good increase	2	2	4	8	29	4	26	59	58	53
Substantial increase	0	0	0	1	0	0	2	6	9	11
Entire State										
Substantially worse	16	11	5	4	2	4	1	1	0	1
Quite a bit worse	24	29	17	5	6	13	5	3	2	3
Slightly worse	53	52	40	16	7	21	9	3	9	9
Same	27	28	40	45	33	52	30	24	20	25
Slightly better	8	8	26	51	62	36	60	55	43	37
Good increase	0	0	0	8	16	1	20	32	38	33
Substantial increase	0	0	0	0	0	0	0	5	8	11
Average of responses, by region										
Entire state										
Own area	−1.9	−1.8	+ .3	+1.1	+1.8	+ .4	+2.0	+2.7	+2.8	+2.8
Entire state	−2.5	−2.3	−1.1	+ .3	+1.1	− .9	+1.2	+2.0	+2.3	+2.2
Upper Peninsula										
Own area	−2.2	−2.3	− .6	+1.3	+1.6	+ .9	+2.0	+2.9	+3.5	+3.2
Entire state	−2.6	−2.0	−1.0	+ .6	+1.4	− .5	+1.0	+2.3	+3.2	+3.1
Northeast Lower Peninsula										
Own area	−2.5	−1.5	+ .5	+2.0	+1.5	+1.2	+3.5	+3.2	+4.0	+3.7
Entire state	−2.8	−2.5	− .5	+1.2	+1.5	− .8	+1.5	+2.8	+2.6	+2.6
Northwest Lower Peninsula										
Own area	−1.2	−1.5	− .3	+1.4	+2.0	+ .8	+2.3	+2.9	+2.6	+2.0
Entire state	−3.1	−3.1	−1.7	− .3	+ .7	−1.1	+ .6	+1.3	+1.7	+1.3
West Central										
Own area	−1.2	−1.4	− .3	+ .7	+1.8	+ .2	+1.5	+2.4	+2.5	+2.7
Entire state	−2.5	−3.1	−1.5	− .2	+ .5	− .9	+ .6	+1.6	+1.6	+1.2
Southwest										
Own area	−3.6	−3.1	− .8	+ .8	+1.9	− .5	+1.9	+3.0	+2.4	+1.4
Entire state	−4.0	−2.9	− .8	+ .3	+1.1	−1.2	+1.3	+1.7	+1.9	+1.4
East Central										
Own area	−1.1	−1.4	+ .2	+1.4	+2.2	+ .7	+2.1	+2.5	+2.6	+3.2
Entire state	−1.7	−2.1	−1.1	+ .7	+1.6	+ .3	+1.9	+2.5	+2.6	+2.9
Southeast										
Own area	−2.1	−1.8	− .5	+ .5	+1.4	+ .4	+1.9	+1.9	+3.0	+2.8
Entire state	−2.4	−1.9	−1.1	0	+ .6	− .5	+ .8	+2.2	+2.6	+2.6

5,000 people to assemble cars in Sterling Heights. General Motors will be building cars in new plants near Pontiac, in Detroit, and in Flint. The amount of net job gain is unknown because many of the assembly workers will be transferred from the old Pontiac, Cadillac, and Buick plants, which will be converted to other use.

Even under relatively optimistic assumptions, there are likely to be approximately 75,000 fewer automotive and supplier jobs in Michigan in 1982 as compared with the 1978 peak.

The competition Michigan faces is formidable. We vie with Ohio and Indiana for the high-skill, high-wage jobs. Th Autopact with Canada, which served Michigan so well until 1978, is now a disadvantage. Canada is demanding and will get from North American vehicle manufacturers not just a bigger share of component production, but also a fairer shake on the higher technology end of it. In addition, much of the research and development that Ontario lost to Michigan during the 1970s will be repatriated during the 1980s. Canada, however, will remain a good market for larger passenger vehicles that bear a Michigan stamp.

At the low skill end of componentry, we compete no longer so much with cheap southern labor as with the cheaper Mexican, Spanish, and Brazilian work forces. Products affected include wiring, mufflers, and tailpipes. Three wire harness and two muffler-tailpipe plants were terminated in Michigan this year. Since not many such plants are left, further attrition will be modest.

Much more so than now, cars of the mid-1980s and beyond will have electronic fuel injection instead of mechanical (carburetors) systems, electronic sensors to warn of malfunction, electronics to fine tune engines during highway use in order to increase miles per gallon, and computers to monitor trips and to advise the driver on miles driven, miles to destination, and so forth.

Small cars use less steel, forgings, cast iron, copper, aluminum, and almost everything else than large ones. Smaller large cars use plastic and aluminum in place of iron and steel wherever possible. These trends are not favorable for Michigan's gray iron foundries, steel mills, and castings plants. Smaller engines will affect the market for Michigan's piston ring and bearing manufacturers, among others.

Because Detroit will not be able to raise capital to finance all of the redesigning and retooling to meet the demands of the 1980s, we will import more components, particularly engines, transmissions, and transaxles for front-wheel-drive cars. Against this, we can expect to export a larger proportion of Wolverine State specialties.

Demand for quality means greater use of robots in assembly. Depending on the relative prices of labor, capital, and energy, and on the degree of specialization in each plant, there could also be greater use of robotics in material handling as well. This better quality also means a larger number of people involved in quality control.

Beyond 1981, Michigan's role in passenger car and component manufacturing depends more than anything else on its ability to meet the quality challenge of the Japanese. This holds true not only for management but also for labor and not just in Detroit but in Cadillac, Benton Harbor, and other places where components are made. Assuming that the challenge is met, a substantial employment job gain, around 6 percent, is forecast for 1982 (Table 4).

Not to be overlooked is this state's considerable stake in truck and bus production. Here, the Japanese penetration has taken place in a market segment that did not previously exist: minitrucks. As a counter, next year GM will begin producing its own version, in Dayton, Ohio, and Pontiac, to replace the Chevy Luv, which it now imports from Japan. In Louisville, Kentucky, Ford will produce a minitruck to replace the Courier, also a Japanese-made vehicle. Volkswagen of America will make its minitruck in Sterling Heights, along with a passenger car.

A U.S. market for medium class diesel trucks was not thought to exist until European manufacturers moved in. Since the invasion by Mercedes Benz, Volvo, Saviem, and IVECO, Ford and General Motors have responded with their American-made products.

The U.S. market for heavy duty trucks still is dominated by American companies because these vehicles, designed for coast-to-coast trucking, are not made overseas. With the deregulation of trucking, however, shorter hauls will become common, providing an opening for European versions of heavy duty road tractors.

TABLE 4
Average Annual Number of Wage and Salary Jobs in Michigan by Broad Industrial Category: Actual 1979, Estimated 1980, and Forecast 1981 and 1982

	(In thousands)			
Category	*1979*	*1980*	*1981*	*1982*
Manufacturing	1,151	983	990	1,045
Contract construction	140	120	120	140
Transportation, communication, and public utilities	159	154	155	160
Wholesale trade	172	167	165	175
Retail trade	585	580	590	660
Finance, insurance, and real estate	153	157	165	180
Services	631	644	665	700
Mining	13	13	13	15
Federal government	56	57	57	60
State government	150	153	145	140
Local government	417	422	410	405

SOURCE: Actual data from Michigan Employment Security Commission, special release; projections from Division of Research, Graduate School of Business Administration, Michigan State University.
NOTE: Figures based on actual data through October 1980; projections thereafter.

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MICHIGAN STATE UNIVERSITY
BERKEY HALL
EAST LANSING, MICHIGAN 48824

CONGRESS INFO SERV 039058 WG
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RESEARCH CENTER FOR DETROIT

by CORINNE L. GILB, *Director, Department of Planning, City of Detroit*

On October 21, 1980, Mayor Coleman A. Young announced a grant from the U. S. Department of Commerce for a Cooperative Generic Technology (COGENT) Center in the City of Detroit. Eventually, the grant will total $8 million. Initial U. S. funding will begin as soon as matching funds of $5 million have been raised nationally from industrial firms.

While some think-tanks are exurban, a center-city location can be advantageous for fast moving research involving multiple interfaces. Detroit's plan is to develop a highly visible research park, with a clear identity and suitable amenity, close to resources of all kinds, including efficient transportation.

RESEARCH PROGRAM

Research will be in computer integrated manufacturing, focusing on near-net shape materials forming, that is, the use of computer applications in the manufacturing processes of forging and casting industries, using strip metal, powdered metal, and composites. The value of computer integrated manufacturing (CIM) is becoming increasingly clear for the quality control and efficiency needed to help American manufacturers compete with foreign companies.

The establishment of a CIM center in Detroit will serve several purposes. It can fill an information gap regarding the concept and development of CIM systems. The high cost of this research has prevented private firms from undertaking exhaustive CIM research projects. This center, through its hardware development, testing, and information gathering will offer technical and consulting assistance to interested parties.

Research into CIM small-batch manufacturing can lead to reduced production costs and greater efficiency.

The CIM approach would include Computer Aided Design (CAD) to reduce development time and costs and Computer Aided Manufacturing (CAM) to increase manufacturing efficiency and reliability. Group technology, that is, the grouping of parts by similarity of production, can make possible greater economies of scale in small-batch manufacturing. CIM also can be used for better materials management, scheduling, machine control, and source data collection. It provides techniques for direct interaction by design laboratories, business offices, and manufacturing and assembly lines.

The following research program has been suggested by Harold Bogart, formerly of Ford Motor Company, and Stanley Stynes, Dean of Engineering at Wayne State University:

> Near net-shape forming processes such as super-plastic forming require research into deformation mechanisms, computer modeling of metal flow, and combination of forming and bonding processes. Advanced nondestructive test techniques, such as optical correlation of methods for evaluating surface distortion, could be investigated.

Preliminary Population Counts: 1980, by Ching-li Wang and Laurence S. Rosen / page 3

BEST AVAILABLE COPY

Formability requirements are becoming increasingly stringent. Research is needed in the formability of high-strength steels (with their associated low strain-hardening coefficients), the development of highly formable materials such as dual-phase steels without the need for microalloying additions, the formability of aluminum alloys, and the formability of metal-plastic-metal laminates such as steel-polpopylene/steel and aluminum/nylon/aluminum. Tests for formability of sheet materials need to be developed to evaluate parameters such as strain-hardening and strain-rate-hardening coefficients under complex stress conditions.

Computer-assisted modeling of sheet metal formability requires further development to incorporate design modifications, material substitution, lubricant substitution, friction, and so forth, for all but the simplest shapes.

Effective use of oriented materials such as Kevlar- and graphite-fiber reinforced composites is possible only if the directional properties of the composite are matched to service conditions. Research could be conducted into the rheological behavior of fiber-containing matrices during forming operations such as molding or stamping. Development of high-rate production processes is critical for application of composites in mass production industries.

Fabrication of parts from dissimilar materials (such as in metal-matrix composites) may be accomplished by diffusion bonding. Research could be done on the processes of adhesion as influenced by temperature, pressure, and surface fibers; on modeling of cohesion and bond strength; and on nondestructive testing of bonds.

The materials problems outlined above are only one aspect of the total forming process. For example, in sheet metal forming, other aspects include part design, die design and construction, lubrication, and press adjustments. Computer-aided design techniques should be used to improve the materials selection and design process.

The principles of structure/property relationships and control of properties through thermomechanical processing of metals such as steel and high-strength aluminum alloys are fairly well understood. These principles often lack practical applications, however. The problem is to adapt existing processing, equipment, and techniques to take advantage of possible improvements, which are understood in principle, by sequencing or redesigning heat treatment/mechanical working steps. Research and development is needed in the use of computer-aided methods for this purpose.

It is hoped that as the quality of the center's research commands international respect and yields visible practical results, Detroit and Michigan will gain in reputation as major centers of industrial innovation. Such a reputation is an important asset with valuable economic side effects. To have the state's leading city more visibly modern will be a source of pride.

The advanced industrial world is on the threshold of an era comparable in importance to the early decades of the industrial revolution. The next decade will see great acceleration in the application of electronics to processes of all kinds—in the office, the schoolroom, the laboratory, the library, the home, and the factory. If Michigan rises to the challenges and opportunities of the electronics revolution, it can reinforce and reclaim its traditional position as a leading industrial state. If it does not respond quickly, expertly, or wisely enough, recent losses of population, jobs, and income will continue.

Modernization of industrial processes, of course, means automation. Robots and computers will replace people, but they will also create new jobs. Workers will be needed to make and maintain the new machinery. Until robots make robots, or make the robots that make the robots, blue-collar workers will still be needed; and so will many more computer-maintenance technicians.

Near-net shaping will eliminate the need for some kinds of machine tooling, but it also will create a market for new kinds of machine tools.

New industrial technology can be especially important to mature cities such as Detroit. It makes sense for robot manufacturers to locate in the industrial heartland, where their market is. Detroit and Michigan have always been major centers for the machine tool industry. Improved research capacity in the city and state will be an attraction.

The center will be run by a nonprofit corporation with a majority of its directors from the private sector. A blue-ribbon industrial task force is being formed to define mission and structure, to solicit membership, and to bring the enterprise to the point of formal incorporation and election of a board of directors. The board will hire a manager and staff.

SITE AND ORGANIZATIONAL AFFILIATIONS

During its start-up phase, the center will be located in leased facilities, preferably in a proposed research park, along with some private industrial research and development facilities and headquarters for a university consortium. The permanent facility, which will require about 160,000 square feet, will be developed by the Detroit Economic Growth Corporation, a public-private partnership of business, government, labor, and community members. The building will be owned by the Growth Corporation and leased to the Detroit Cooperative Generic Technology Center. It is proposed to have 40,000 square feet of heavy industrial space, 40,000 square feet of light industrial space, and 80,000 square feet for offices, laboratories, a computer center, classrooms, and other uses.

In addition to the Detroit Economic Growth Corporation, members will include Detroit Renaissance, Inc., the Greater Detroit Chamber of Commerce, the Inner City Business Improvement Forum, Northeast Manufacturers Association, Society of Manufacturing Engineers, Michigan Energy and Resource Research Association, General Motors, Burroughs Corporation, Bendix Corporation, Rockwell International, Ford Motor Company, Gulf and Western, Chrysler Corporation, the United Auto Workers, the University of Michigan, Wayne State University, and the University of Detroit. Several other companies, institutions, and associations have indicated an interest.

Much of the spadework has yet to be done, but the project is moving. While the Technology Center is in process of formation, inquiries can be directed to the City of Detroit's Planning Department, 3400 Cadillac Tower, Detroit, Michigan 48226.

PRELIMINARY POPULATION COUNTS: 1980

by CHING-LI WANG *and* LAURENCE S. ROSEN, *Office of the Budget, Department of Management and Budget*

The preliminary counts of the 1980 census of population and housing recently released by the U. S. Census Bureau show 9,236,891 people in Michigan as of April 1, 1980.[1] This figure represents an increase of 355,065 persons from 8,881,826 a decade ago. Population growth in Michigan has slackened in the past ten years; Michigan has grown by only 4 percent since the last decennial census, and this is less than one-third of the growth rate the state experienced between 1960 and 1970. For the United States as a whole, the total 1980 population is 226 million, an increase of 11 percent between 1970 and 1980. Michigan's population growth during the past decade is significantly lower than the national rate. The state has become the eighth largest in population, dropping from seventh, a rank it had held since the turn of the century.

POPULATION CHANGE BY COUNTIES

Since 1970, population has increased in 90 percent of Michigan's counties. The fastest growing (30 percent or more) include Kalkaska (103.4), Livingston (70), Roscommon (65), Gladwin (47.2), Oscoda (44.8), Crawford (46.2), Otsego (43.8), Montmorency (42.3), Clare (42.8), Missaukee (40.3), Grand Traverse (39.6), Ogemaw (38.1), Lake (37.8), Alcona (36.6), Lapeer (33.7), and Arenac (32.3). With the exception of Livingston and Lapeer, all of the fastest growing counties are located in the northern lower peninsula.

Other fast growing counties (between 20 percent and 30 percent) include Eaton (28 percent), Allegan (22.1), Ottawa (22.5), Oceana (21.6), Newaygo (24.5), Osceola (27.2), Wexford (26.8), Benzie (29.9), Antrim (28.2), Charlevoix (20.3), Emmet (24.3), Cheboygan (24.3), and Isabella (21). These are located either in the northern lower peninsula or in areas adjacent to the central counties of metropolitan areas.

More moderately growing counties are located primarily in the southern lower peninsula, and they tend to cluster in the metropolitan fringe areas surrounding several of Michigan's major urban centers. For example, St. Clair (15.4 percent), Macomb (11.1 percent), Oakland (11.6 percent), Washtenaw (11.7 percent), Lenawee (13.4 percent), Monroe (12 percent), Tuscola (17 percent), and Sanilac (15.8 percent) counties all surround southeastern Michigan's metropolitan centers and all experienced moderate rates of growth. Midland (15.5 percent), Shiawassee (12.8 percent), Clinton (14.9 percent), Ionia (12.7 percent), Montcalm (19.8 percent), and Barry (19.8 percent) counties are adjacent to Bay City, Saginaw, Flint, Lansing, Grand Rapids, and Battle Creek, respectively. Southwestern Michigan counties adjacent to Kalamazoo, such as Van Buren (18.7 percent), Cass (14.3 percent), and St. Joseph (18 percent), also experienced moderate growth during the past ten years.

The counties growing most slowly (less than 10 percent growth rate) are located mainly in southern lower Michigan and in the Upper Peninsula. Those that contain the central cities of Standard Metropolitan Statistical Areas experienced particularly slow rates of growth. These include Bay (2.1 percent), Saginaw (3.7 percent), Genesee (1.1 percent), Ingham (4.3 percent), Jackson (5.6 percent), Kalamazoo (5.1 percent), and Kent (8 percent). Berrien, Branch, and Hillsdale counties, along Michigan's southern border, also joined the list of slow growth areas, along with Huron (6.9 percent), Gratiot (3.0 percent), and Alpena (5.0 percent) counties farther north. In addition, in the remote areas of the Upper Peninsula, only Marquette County experienced substantial growth, while all of the Upper Peninsula's other counties either grew very slowly or declined.

Nine Michigan counties lost population during the past decade—Wayne (−12.9 percent), Muskegon (−0.2 percent), Calhoun (−0.8 percent), Chippewa (−10.6 percent), Gogebic (−5.1 percent), Iron (−1.5 percent), Ontonagon (−6.8 percent), Luce (−1.9 percent), and Keweenaw (−13.3 percent). Wayne County alone has declined by more than 345,000 persons since 1970. Most of the other declining counties are in the Upper Peninsula.

Despite the uneven pace of population growth in the past ten years, the rank order of population size among counties has not changed much. This is especially true among counties with populations over 50,000 (see Table 1). Two exceptions are Livingston, which jumped from the rank of twenty-fourth largest county in 1970 to eighteenth in 1980, and Ottawa, which jumped from fourteenth to twelfth. Wayne is still the largest county in the state (2,324,697), although its population has declined by 12.9 percent since 1970. Oakland is still second with a population of more than one million, followed by Macomb with a population of 694,458. Forty-four percent of Michigan's population remains concentrated in these three counties.

In contrast, some dramatic changes in ranking by size occurred among counties with populations under 20,000. Roscommon jumped from a rank of seventieth to sixty-second, and Kalkaska jumped from seventy-ninth to seventieth. Ontonagon slid from a rank of sixty-seventh to seventy-third, and Luce dropped from seventy-sixth to eighty-second. Keweenaw remained smallest, with only 1,964 people in 1980.

POPULATION CHANGE AMONG MAJOR CITIES

Following the trend throughout most of the United States, major cities in Michigan experienced a general decline in population during the past ten years. The preliminary counts show that more than 75 percent of the major cities in Michigan are losing population. With the exception of Ann Arbor, almost every city with more than 50,000 residents in 1970 had a net population loss between the two decennial censuses. The most dramatic

(Continued on page 5)

[1]As required by Public Law 94-171, final state population totals were presented to the President on January 1, 1981. Final detailed figures for counties, cities, and other substate localities are due to be released no later than April 1, 1981.

The MICHIGAN STATE ECONOMIC RECORD

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Michigan Economic Indicators

Item	Year previous of latest month	Previous month	Latest month
Manufacturing workers:			
Average weekly hours, Michigan	41.0	40.1	41.1 (Oct.)
Average weekly hours, U.S.	40.2	39.8	39.8 (Oct.)
Average hourly earnings, Michigan ($)	8.94	9.64	10.03 (Oct.)
Average hourly earnings, U.S. ($)	6.82	7.43	7.49 (Oct.)
U.S. motor vehicle production (units)	607,205	708,964	612,398 (Dec.)
Michigan electricity usage (mil. kwh.)	5,873	5,900	5,860 (Oct.)
Industrial (mil. kwh.)	2,859	2,598	2,762 (Oct.)
Residential (mil. kwh.)	1,639	1,874	1,726 (Oct.)
Raw steel production:			
Michigan (000 net tons)	753	737	760 (Nov.)
United States (000 net tons)	9,997	9,442	10,057 (Nov.)
Consumer price index (1967 = 100)			
Detroit area	231.3	264.3	266.4 (Nov.)
United States	227.5	253.9	256.2 (Nov.)
U.S. wholesale price index (1967 = 100)	247.2	277.0	278.4 (Nov.)
Michigan farm prices received index (1967 = 100)	232	264	267 (Nov.)

SOURCES: U.S. Bureau of the Census; U.S. Bureau of Labor Statistics; Michigan Crop Reporting Service; Motor Vehicle Manufacturers Association, Inc.; American Iron and Steel Institute; and Energy Information Administration.

Contracts for Future Building, First 11 Months: 1979 and 1980

(Thousands of Dollars)

Area	Nonresidential 1979	Nonresidential 1980	Nonresidential Percentage change	Residential 1979	Residential 1980	Residential Percentage change	Total[a] 1979	Total[a] 1980	Total[a] Percentage change
Ann Arbor	72,318	99,276	+ 37	72,601	56,537	−22	144,919	155,813	+ 8
Battle Creek	32,340	25,885	− 20	41,514	20,350	−51	73,854	46,235	−37
Bay City	11,695	16,623	+ 42	16,385	17,842	+ 9	28,080	34,465	+23
Detroit	956,407	995,996	+ 4	1,056,257	571,031	−46	2,012,664	1,567,027	−22
Flint	80,858	85,026	+ 5	94,558	37,392	−60	175,416	122,418	−30
Grand Rapids	256,656	166,346	− 35	164,167	136,471	−17	420,817	302,817	−28
Jackson	19,983	43,806	+119	26,736	10,519	−61	46,719	54,325	+16
Kalamazoo–Portage	43,057	45,563	+ 6	66,942	58,755	−12	109,999	104,318	− 5
Lansing–East Lansing	95,090	109,041	+ 15	146,782	106,303	−28	241,872	215,344	−11
Muskegon–Norton Shores–Muskegon Heights	20,808	15,494	− 26	25,500	26,395	+ 4	46,308	41,889	−10
Saginaw	36,433	39,024	+ 7	51,089	36,104	−29	87,522	75,128	−14
Michigan	1,858,486	1,800,437	− 3	2,291,049	1,436,706	−37	4,149,535	3,237,143	−22
United States	46,717,200	47,767,100	+ 2	70,356,100	57,654,800	−18	117,073,300	105,421,900	−10

SOURCE: F. W. Dodge Division of McGraw-Hill Information Systems Company, news releases.

NOTE: Battle Creek includes Barry and Calhoun counties; Detroit includes Lapeer, Livingston, Macomb, Oakland, St. Clair, and Wayne counties; Flint includes Genesee and Shiawassee counties; Grand Rapids includes Kent and Ottawa counties; Kalamazoo-Portage includes Kalamazoo and Van Buren counties; Lansing–East Lansing includes Clinton, Eaton, Ingham, and Ionia counties; and Muskegon–Norton Shores–Muskegon Heights includes Muskegon and Oceana counties.

a. Excludes nonbuilding construction contracts. This category comprises streets and highways, bridges, dams, reservoirs, river and harbor developments, sewerage and water supply systems, missile and space flight facilities, airports, utilities, and communication systems. For Michigan the 1979 and 1980 figures for nonbuilding construction contracts were $867,766,000 and $636,189,000 respectively, or a decrease of 37 percent. U. S. figures for nonbuilding construction contracts were $40,926,800,000 and $29,271,300,900 or a decrease of 28 percent.

(Continued from page 3)

change occurred in Detroit, where population decreased by 21.3 percent (−321,841). Other cities with a net loss of more than 15 percent include Flint (−17.5 percent), Saginaw (−15.6 percent), Royal Oak (−17.9 percent), Dearborn Heights (−15.5 percent), Lincoln Park (−15.1 percent), Bay City (−15.9 percent), Wyandotte (−17.3 percent), Allan Park (−16.2 percent), and East Detroit (−15.9 percent). All of these are either older industrial cities associated with automobile manufacturing or older, close-in suburbs of Detroit. In addition, Grand Rapids, Lansing, Kalamazoo, Jackson, Battle Creek, and Muskegon all lost population. The central city of every metropolitan area except Ann Arbor experienced population decline since 1970.

Despite the overall decline in these larger cities, some major cities in Michigan gained substantially in the past ten years. The Detroit suburb of Sterling Heights, for example, has a 1980 population of 108,998, an increase of 47,633 or 77.6 percent from 61,365 in 1970. Troy, a commercial center and residential suburb north of Detroit, increased from 39,419 in 1970 to 67,003 in 1980, growing by 70 percent. Also growing are the Detroit suburbs of Taylor (10.6 percent), Southfield (8.9 percent), and Farmington Hills (18.9) and Portage, a suburb of Kalamazoo. Small increases also occurred in Ann Arbor (3.5 percent), East Lansing (1 percent), and Wyoming (5.4 percent). All of these growing cities are located in major metropolitan areas. None, however, is a major manufacturing center nor is any directly dependent on the auto industry.

POPULATION CHANGE IN METROPOLITAN AREAS

Among the twelve Standard Metropolitan Statistical Areas (SMSA) in Michigan, only that of Detroit, which includes six counties (Wayne, St. Clair, Oakland, Macomb, Livingston, and Lapeer), lost population in the past ten years. All of the others experienced growth ranging from 2 percent in the Muskegon–Norton Shores–Muskegon Heights SMSA to 11.7 percent in the Ann Arbor SMSA and 11.5 percent in the Grand Rapids SMSA. As discussed above, the major SMSA cities have experienced general population decline. Thus, growth in these areas is primarily due to the increase of population in suburban areas of counties in the urban fringe. The degree of population loss to the central metropolitan city determines the overall growth rate of the metropolitan areas. For example, the Ann Arbor SMSA had the highest population growth among SMSAs because the city of Ann Arbor continued growing during the past decade. In contrast, the drastic decline in the City of Detroit and its immediate surrounding areas caused a 2.1 percent decrease for the entire metropolitan area despite fast growth in fringe counties such as Livingston and Lapeer and moderate but substantial growth in Oakland, Macomb, and St. Clair.

Although detailed 1980 census data will not be available for some time, analysis of intercensal estimates indicate that most growth in Michigan's metropolitan areas has been due to natural increase (births exceeding deaths) rather than to migration.[2] Based on preliminary calculations, the Battle Creek, Bay City, Detroit, Jackson, Muskegon, and Saginaw SMSAs all experienced substantial outmigration during the past decade. In contrast, the Ann Arbor, Grand Rapids, Kalamazoo–Portage, and Lansing–East Lansing SMSAs, and the Michigan portion of the Toledo SMSA (Monroe County) all experienced growth rates in excess of the rate of natural increase, thus indicating growth through migration as well as through natural population increase. The key distinction between these two groups of metropolitan areas is that the first (outmigration SMSAs) is extensively industrialized and largely dependent on the automobile industry; the second (inmigration SMSAs), while also industrialized, has more diversified economies. The latter SMSAs include university and government centers in Ann Arbor, Lansing, and East Lansing as well as extensive commercial, service, and manufacturing sectors not directly related to the auto industry in Grand Rapids and Kalamazoo.

Michigan in 1980 remains a heavily urbanized state in which eight of every ten residents live within one of the state's twelve metropolitan areas. Nonetheless, there have been significant changes in this pattern. Since 1970, the entire population of all metropolitan areas in Michigan went from 7,354,147 to 7,469,991, an increase of 116,000 or 1.6 percent. As discussed in the preceding section, this minimal growth implies a considerable amount of net outmigration from metropolitan areas during the ten-year period. The loss through migration occurred primarily in the counties where the central cities of metropolitan areas are located. In comparison, fringe counties—SMSA counties that do not contain central cities—have grown by more than 15 percent since 1970. This increase in SMSA fringe areas, however, did not compensate for the loss through migration from central SMSA counties.

POPULATION CHANGE IN NONMETROPOLITAN AREAS

It is evident that some of this migration has been directed toward Michigan's nonmetropolitan cities, towns, and rural areas. Nonmetropolitan areas in Michigan grew by 239,921 persons, a 15.6 percent increase, between the two censuses. By applying a natural increase rate of 6.9 percent for nonmetropolitan areas since 1970, we see that the total 15.6 percent increase in population suggests a substantial amount of net migration to these areas.[3] Thus, it appears that the nationwide turnaround from nonmetropolitan decline to nonmetropolitan growth, as suggested by Calvin Beale (1975), has been significant in Michigan. However, the growth rates vary from place to place. Patterns can be seen more clearly if we divide nonmetropolitan areas into three groups: (1) all nonmetropolitan counties in the southern half of the lower peninsula

[2]The estimated natural population increase for Michigan's SMSAs between 1970 and 1980 is 7.8 percent. This is derived from 1,175,000 estimated births and 600,000 estimated deaths during the past decade divided by the 1970 metropolitan population of 7,354,147. Any SMSA that grew by more than 7.8 percent between 1970 and 1980 is assumed to have experienced more inmigration than outmigration. Those that grew at a lower rate experienced net outmigration during the past ten years, offset only partially by natural population increase.

[3]The natural increase of 6.9 percent for nonmetropolitan areas is derived from estimated births of 265,000 and estimated deaths of 160,000 in nonmetropolitan areas between 1970 and 1980, divided by 1970 population, 1,527,679.

TABLE 1
The Population of Michigan by County and Components of Change: 1970–1980

County	1980 preliminary	1970 census	Change 1970-1980		Components of change			
			Number	Percentage	Births*	Deaths*	Net migration Number	Net migration Percentage
Alcona	9,719	7,113	2,606	36.6	1,019	1,140	2,727	38.3
Alger	9,220	8,568	652	7.6	1,318	1,030	364	4.3
Allegan	81,318	66,575	14,743	22.1	12,262	6,023	8,503	12.8
Alpena	32,238	30,708	1,530	5.0	4,884	2,705	−649	−2.1
Antrim	16,166	12,612	3,554	28.2	2,275	1,641	2,921	23.2
Arenac	14,752	11,149	3,603	32.3	2,060	1,413	2,956	26.5
Baraga	8,480	7,789	691	8.9	1,324	1,000	367	4.7
Barry	45,755	38,166	7,589	19.9	6,411	3,591	4,769	12.5
Bay	119,849	117,339	2,510	2.1	19,192	9,706	−6,975	−5.9
Benzie	11,165	8,593	2,572	29.9	1,425	1,218	2,366	27.5
Berrien	170,897	163,940	6,957	4.2	29,357	15,414	−6,986	−4.3
Branch	40,105	37,906	2,199	5.8	6,000	3,775	−25	−0.1
Calhoun	140,788	141,963	−1,175	−0.8	22,580	12,946	−10,810	−7.6
Cass	49,514	43,312	6,202	14.3	7,136	4,057	3,123	7.2
Charlevoix	19,892	16,541	3,351	20.3	2,912	1,852	2,291	13.9
Cheboygan	20,605	16,573	4,032	24.3	3,035	2,017	3,014	18.2
Chippewa	28,964	32,412	−3,448	−10.6	6,371	2,948	−6,872	−21.2
Clare	23,834	16,695	7,139	42.8	2,865	2,367	6,641	39.8
Clinton	55,715	48,492	7,223	14.9	8,176	3,240	2,288	4.7
Crawford	9,475	6,482	2,993	46.2	1,292	851	2,552	39.4
Delta	38,963	35,924	3,039	8.5	6,001	4,052	1,090	3.0
Dickinson	25,777	23,753	2,024	8.5	3,295	3,064	1,793	7.6
Eaton	88,177	68,892	19,285	28.0	11,304	5,063	13,044	18.9
Emmet	22,792	18,331	4,461	24.3	3,184	2,021	3,299	18.0
Genesee	450,343	445,589	4,754	1.1	78,075	32,652	−40,669	−9.1
Gladwin	19,830	13,471	6,359	47.2	2,383	1,749	5,726	42.5
Gogebic	19,617	20,676	−1,059	−5.1	2,507	3,032	−534	−2.6
Grand Traverse	54,698	39,175	15,523	39.6	7,427	3,903	11,999	30.6
Gratiot	40,425	39,246	1,179	3.0	6,764	3,563	−2,022	−5.2
Hillsdale	42,152	37,171	4,981	13.4	6,217	3,645	2,410	6.5
Houghton	37,839	34,652	3,187	9.2	5,030	4,760	2,916	8.4
Huron	36,422	34,083	2,339	6.9	5,614	4,102	827	2.3
Ingham	272,288	261,039	11,249	4.3	44,547	16,525	−16,772	−6.4
Ionia	51,670	45,848	5,822	12.7	8,433	4,204	1,593	3.5
Iosco	28,273	24,905	3,368	13.5	5,497	2,569	439	1.8
Iron	13,607	13,813	−206	−1.5	1,532	2,106	368	2.7
Isabella	53,943	44,594	9,349	21.0	7,168	3,018	5,199	11.7
Jackson	151,324	143,274	8,050	5.6	22,543	12,686	−1,807	−1.3
Kalamazoo	211,921	201,550	10,371	5.2	30,132	13,903	−5,857	−2.9
Kalkaska	10,926	5,372	5,554	103.4	1,514	911	4,950	92.2
Kent	444,030	411,044	32,986	8.0	70,815	34,649	−3,181	−.8
Keweenaw	1,964	2,264	−300	−13.3	272	349	−223	−9.9
Lake	7,801	5,661	2,140	37.8	973	1,101	2,268	40.1
Lapeer	69,992	52,361	17,631	33.7	10,421	4,443	11,653	22.3
Leelanau	13,986	10,872	3,114	28.6	1,626	1,227	2,715	24.9
Lenawee	89,986	81,951	8,035	9.8	14,667	7,267	635	0.8
Livingston	100,260	58,967	41,293	70.0	11,569	4,989	34,713	58.9
Luce	6,659	6,789	−130	−1.9	1,021	735	−416	−6.1
Mackinac	10,193	9,660	533	5.5	1,454	1,145	224	2.3
Macomb	694,458	626,204	68,254	10.9	96,277	40,012	11,990	1.9
Manistee	22,992	20,393	2,599	12.7	2,902	2,627	2,324	11.4
Marquette	74,115	64,686	9,429	14.6	12,801	5,394	2,023	3.1
Mason	26,343	22,612	3,731	16.5	3,476	2,592	2,846	12.6
Mecosta	36,925	27,992	8,933	31.9	4,680	2,443	6,696	23.9
Menominee	26,224	24,587	1,637	6.7	3,526	2,812	923	3.8
Midland	73,672	63,769	9,903	15.5	11,236	4,002	2,669	4.2
Missaukee	9,997	7,126	2,871	40.3	1,435	888	2,323	32.6
Monroe	133,524	119,215	14,309	12.0	20,105	8,974	3,178	2.7
Montcalm	47,532	39,660	7,872	19.9	7,561	4,425	4,736	11.9
Montmorency	7,467	5,247	2,220	42.3	945	839	2,114	40.3
Muskegon	157,103	157,426	−323	−.2	25,733	13,598	−12,458	−7.9

TABLE 1 (Cont.)

County	1980 preliminary	1970 census	Change 1970-1980		Components of change			
			Number	Percentage	Births*	Deaths*	Net migration Number	Net migration Percentage
Newaygo	34,864	27,992	6,872	24.6	5,010	3,135	4,998	17.9
Oakland	1,013,473	907,871	105,602	11.6	137,100	65,284	33,786	3.7
Oceana	21,865	17,984	3,881	21.6	3,465	2,075	2,491	13.9
Ogemaw	16,439	11,903	4,536	38.1	2,114	1,838	4,260	35.8
Ontonagon	9,832	10,548	−716	−6.8	1,594	1,225	−1,085	−10.3
Osceola	18,879	14,838	4,041	27.2	2,904	1,863	3,000	20.2
Oscoda	6,843	4,726	2,117	44.8	753	781	2,140	45.3
Otsego	14,983	10,422	4,561	43.8	2,208	1,067	3,421	32.8
Ottawa	156,975	128,181	28,794	22.5	23,283	9,103	14,615	11.4
Presque Isle	14,217	12,836	1,381	10.8	2,049	1,342	674	6.3
Roscommon	16,324	9,892	6,432	65.0	1,688	1,830	6,574	66.5
Saginaw	227,862	219,743	8,119	3.7	39,296	17,721	−13,457	−6.1
St. Clair	138,685	119,280	19,405	16.3	20,850	12,358	10,914	9.2
St. Joseph	55,917	47,392	8,525	18.0	8,850	4,943	4,618	9.7
Sanilac	40,729	35,181	5,548	15.8	6,072	4,081	3,557	10.1
Schoolcraft	8,574	8,226	348	4.2	1,301	1,114	162	2.0
Shiawassee	71,136	63,075	8,061	12.8	11,790	5,192	1,463	2.3
Tuscola	56,843	48,603	8,240	17.0	8,850	4,486	3,876	8.0
Van Buren	66,696	56,173	10,523	18.7	10,415	5,904	6,011	10.7
Washtenaw	261,405	234,103	27,302	11.7	37,708	13,048	2,642	1.8
Wayne	2,324,697	2,670,368	−345,671	−12.9	404,393	247,840	−502,210	−18.8
Wexford	24,992	19,717	5,275	26.8	3,684	2,368	3,959	20.1
Michigan Total	9,236,891	8,881,826	355,065	4.0	1,439,904	759,551	−325,289	−3.66

*The number of births and deaths are derived from reported vital statistics released by the Department of Public Health between 1970 and 1979. For 1970 births and deaths, three-quarters of that year's total amount are used as the period between April 1, 1970, through December 31, 1970. The 1980 births and deaths are an extrapolation of the 1979 data by taking one-quarter of the amount.

from Bay County to Oceana County (southern lower Michigan); (2) all counties in the lower peninsula north of this line (northern lower Michigan); and (3) the counties of the Upper Peninsula.

The northern lower peninsula gained about the same number of people as the southern lower peninsula during the past ten years. This gain of 111,663 persons boosted the population of northern lower Michigan from 383,965 in 1970 to 495,628 in 1980, a 29 percent increase. This growth rate indicates a substantial influx of residents to the northern lower peninsula. We estimate that more than 80 percent of the growth to this area in the past ten years has been due to migration.[4] Nonmetropolitan areas in southern lower Michigan also gained population, but the growth rate was lower than in the northern lower peninsula. This area gained 111,877 persons or 13.3 percent in the past decade. The growth rate suggests some degree of net migration to the area although this is estimated to represent only about one-third of the total growth.[5]

Population growth in the Upper Peninsula during the 1970s was not spectacular (5.2 percent) nor was it spread evenly among the region's fifteen counties. Nonetheless, this growth is significant in that the Upper Peninsula had lost population steadily for fifty years until this turnaround during the past decade. Between 1970 and 1980, the Upper Peninsula gained 15,681 people, mainly in the central portion, where Marquette County added 9,429 residents (14.6 percent). Several thousand more were added to Houghton, Alger, Menominee, Delta, and Dickinson counties. Even greater population growth had been expected to result from the rural revival of the 1970s, but several events hurt the economy of the Upper Peninsula. The closing of Kincheloe Air Force Base near Sault Ste. Marie led to the loss of several thousand military personnel and their dependents from Chippewa and Luce counties during the past three years. Layoffs at the White Pine mine in the western Upper Peninsula affected the populations of Gogebic, Iron, and Ontonagon counties. These losses, however, were offset by increases in retirement to the Upper Peninsula, tourism, college enrollments, and the expansion of the timber and wood pulp industries.

CONCLUSIONS AND DISCUSSION

The preliminary census count of Michigan's population in 1980 is very close to what was estimated in the *Economic Report of the Governor* (1980), which shows 9.24 million. The overall trends for counties, major cities, and geographic areas (metropolitan versus nonmetropolitan) are also close to what was expected. Several conclusions can be derived from the preliminary count of the 1980 census of population in comparison with the 1970 census.

Population growth in Michigan has been lower during the past ten years than in previous decades, and it has been lower than the national rate. The proportion of the U. S. population residing in Michigan also decreased. Approximately 4.4 percent of the U. S. population resided in Michigan in 1970; in 1980 the proportion is approximately 4 percent. This slackening of growth is due pri-

[4]Based on estimated births of 68,500 and estimated deaths of 46,700 between 1970 and 1980 in the northern lower peninsula, net migration was about 90,000 in the ten-year period.

[5]For nonmetropolitan areas in southern lower Michigan, the number of births was estimated to be 147,000 and the number of deaths about 78,000 between 1970 and 1980. The net migration was about 43,000.

marily to population loss in metropolitan areas, especially in and around their central cities.

Despite the overall slowing of population growth in Michigan, nonmetropolitan areas have been gaining population at astonishingly fast rates. The growth of population in Michigan's nonmetropolitan areas accounts for 68 percent of the total in the state. Counties in the northern lower peninsula gained population at particularly fast rates, while nonmetropolitan areas in the southern lower peninsula grew at more moderate rates. Although the Upper Peninsula has revived in population growth after long-term population loss in previous decades, this has taken place at a relatively slow rate.

Although Michigan's nonmetropolitan rate of growth outpaced that of the state's various metropolitan areas, the amount of growth and the number of people residing in rural areas remain relatively small. Even with the spectacular increase in the northern lower peninsula, the total population of the nonmetropolitan parts of Michigan is still less than 20 percent of the state's population. The gain in nonmetropolitan areas throughout Michigan has not compensated for the decline experienced in its metropolitan areas. Nonetheless, this pattern of growth is significant and bears further examination.

Common wisdom attributes much of the growth in northern and rural areas to retirement migration from older industrial areas in southern Michigan. Paul R. Voss and Glenn V. Fuguitt's (1979) examination of migration to the upper Great Lakes region confirms that almost one-half of the families moving to the region have household heads over the age of 50 and that most have moved from metropolitan areas in the lower Great Lakes basin. Migration from Detroit alone accounted for 44 percent of the migration from southern Michigan industrial areas. There is evidence that this movement toward metropolitan deconcentration is partly a function of growing economic opportunities in less-populated areas. John M. Wardwell and C. Jack Gilchrist (1980) have documented an employment turnaround in nonmetropolitan areas to accompany the one in population. They indicate this is due in part to changes in the employment structures of both the large metropolitan areas and the small nonmetropolitan areas.

Although population growth in Michigan's nonmetropolitan areas can be attributed to significant movement from metropolitan areas in the state, these gains do not fully offset the decline in Michigan's metropolitan areas. It is generally believed that there has been substantial migration from Michigan to other states. In fact, there is at all times substantial movement into and out of Michigan as well as all other states. Population estimates produced last year (FSCP, 1979), however, indicate that Michigan had 298,000 more outmigrants than inmigrants between 1970 and 1979. More specific analysis of Internal Revenue Service data by Richard A. Engels and Mary Kay Healy (1980) indicate that between 1978 and 1979 more than 10 percent of outmigrants from Michigan moved to California or Florida. Although Michigan received migrants from other states such as Ohio and Illinois, the net loss during this period was about 41,000 people.

As the structure of the American economy continues to change, and as Michigan continues to suffer extraordinary rates of unemployment because of these structural changes, the patterns of population change and movement described here are likely to continue. Undoubtedly, when recovery finally occurs in Michigan, more automobiles will be manufactured. However, increased automation of the manufacturing process and the shift toward smaller vehicles will mean fewer workers. Deconcentration of components manufacturing and increased foreign components purchases will also diminish the demand for industrial labor in Michigan. Moreover, the increased reliance on microprocessors to replace mechanical control devices in automobiles, the one bright area of growth in the auto industry in the near future, will probably provide little benefit for Michigan. These products are produced mainly in California, Texas, the Pacific Northwest, and the high-amenity areas of Colorado, Idaho, and Utah.

Michigan's metropolitan areas also lag in the development of the fast-growing service and high technology sectors of the economy. Thus, it is likely that Michigan's colleges and universities will continue to produce high quality engineers, technicians, and other skilled workers who will be forced to seek work elsewhere. The one optimistic note is that the more diversified economies of, say, Ann Arbor and Grand Rapids, and the high-amenity areas to the north could capitalize on these trends and become Michigan's growth centers of the future.

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